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General

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1. This report contains descriptions of the various projects assigned to laboratories of the Picture Tube Department.

Picture Tube ACR-2

2. Research and development of this 10-inch cathode ray tube was started in 1946 and was completed in 1948. The tube originally was designed for a 10-kilovolt aquadag voltage. It was changed later to 30 kilovolts and was to be used in oscillographs. This tube was to be produced at an unknown factory believed to be located in Moscow. The ACR-2's were being mass-produced in early 1949, because we received one of them in our testing laboratory. The type number of the tube had been changed to an unknown designation and was developed by members of the Picture Tube Development Laboratory under the guidance of Dr Klang (now at Oberspreewerk, Berlin) and Dipl Ing Fiedler (now at the Central Laboratory for Rundfunks, Berlin-Adlershof).

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Picture Tube ACR-10

3. Development of this 5-inch cathode ray tube was started in 1946 and completed in 1948. It was designed for a maximum aquadag voltage of 2 kilovolts and is to be used in an oscilloscope. As in the case of ACR-2, the tube was put into mass production at an unknown factory in Moscow in 1948.

these tubes were actually produced at the Vacuum Tube Plant located at NII 160. This tube was developed by the same laboratory that developed the ACR-2.

Kinescopes

4. The 9-inch round kinescope that was developed at NII 160 is identical to the CRT used in the T2, Leningrad television receiver. This tube was to go into mass production in Moscow in 1948. It is also presently being produced at OSW in Berlin. Development of the 12-inch round kinescope was completed in 1949 and the tube entered mass production at this time; this tube is also presently being manufactured at OSW in Berlin. In 1950 samples of RCA metal kinescopes were obtained from America. These samples were studied for the purpose of copying them; however, no successful copies had been made at NII 160 by the first of 1950. The largest problem prohibiting successful copying of the rectangular kinescope was that of finding a good glass-to-metal seal.

5. By late 1949 a small projection kinescope had been developed at NII 160. this tube had a face diameter of approximately 10 cm and was to have an aquadag voltage of 30 kilovolts.

Iconoscopes

6. The testing of laboratory-manufactured iconoscopes was started by the laboratory of German scientist Hass in 1948. The number of scopes manufactured and tested continually increased until 30 were tested each month in the first part of 1950. The tested iconoscopes were picked up by personnel employed by the Moscow Television Center.

7. a total of 20 super-iconoscopes were produced at NII 160 prior to the last of 1950. In the beginning of 1950, a bread-board model of the "Tonne" television equipment was brought to NII 160 by an unknown Soviet civilian. This equipment was of German manufacture, was delivered to Soviet engineer Zakharov, and was to be used in testing super-iconoscopes. The equipment consisted of the Tonne television camera, the normal amplifier, the synchronizer, the television receiver, and the raster generator. The transmitter was not included in the equipment inasmuch as a cable served as the connecting device. Zakharov asked various German engineers to help him get the equipment into operation; however, they all pleaded ignorance, so Zakharov left the institute to receive instructions on the equipment. A week later he returned and put the equipment into operation. Zakharov had gone to a Soviet aviation institute located in Moscow to receive instructions on operating the old Tonne equipment. the super-iconoscopes produced at NII 160 were to be used in Tonne equipment installed in flying bombs.

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Dark Trace Tubes

8. Research on dark trace tubes was started in 1947 [redacted]

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Dr Rottgardt

[redacted] was in charge of this development.

[redacted] these tubes will be used in radar equipment developed by the Soviets. OSW had delivered complete testing equipment for these tubes. [redacted]

Kinescope Testing Apparatus

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9. A total of six picture tube testing instruments were developed and produced by the Test Instrument Laboratory [redacted]. Five of these test instruments were made for various laboratories of NII 160, while the sixth one was delivered to the vacuum tube producing factory at NII 160 in the summer of 1950. Each of these instruments was designed to test picture tube persistency, definition, proper screen construction (operating test), proper electron gun construction (by operational test), and over-all performance characteristics of the tube.

Iconoscope Testing Equipment

10. Equipment designed to test iconoscopes was completed in 1950. This equipment consisted of a roster generator preamplifier, a mixing amplifier, a shading generator, and a final amplifier. Only one set was made and it was for use at the NII 160 laboratories; however, the technical data, operating instructions, and schematics were forwarded to Moscow. The entire equipment was used for testing iconoscopes that were produced in the laboratories of Zavod 160, and was considered to be nothing more than an incorporation of various known circuitry.

Synchronizing Generator Development

11. Three synchronizing generators were built by the Testing Laboratory of the Picture Tube Department. The first generator was completed in 1947 and was used to furnish signals for all the various laboratories. It was located in the Test Laboratory and had its signal output connected to the other laboratories. This generator was built in a short period of time due to the pressing need for such a piece of equipment. It was used to furnish signals for a 625-line-per-second television roster; however, it was never successful, due to the fact that it used inferior components. The output frequency was very unstable and varied with temperature changes.

12. Synchronizing generator number two was completed in 1948, and was basically the same as the first one except better components were utilized. A very well-regulated power supply was used and all divided stages were equipped with metallic paper condensers. This generator replaced the first one.

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13. The third synchronizing generator [redacted]

[redacted] was completed in the beginning of 1951. It was designed to operate with counter-circuits, which determined the frequency of a master flip-flop oscillator. [redacted]

[redacted] All three of these generators were built for use at NII 160; however, complete technical reports of the equipment were forwarded to Moscow.

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